

## TRAIN LOCATION SYSTEM AND METHOD

### ABSTRACT

A train location system and method utilizes inertial measurement inputs, including orthogonal acceleration inputs and turn rate information, in combination with wheel-mounted tachometer information and GPS/DGPS position fixes to provide processed outputs indicative of track occupancy, position, direction of travel, velocity, etc. Various navigation solutions are combined together to provide the desired information outputs using an optimal estimator designed specifically for rail applications and subjected to motion constraints reflecting the physical motion limitations of a locomotive. The system utilizes geo-reconciliation to minimize errors and solutions that identify track occupancy when traveling through a turnout.